Frankly Speaking

Taking Stock

THE war has taught us many things and will likely teach many more. The needs for motor vehicle transportation and the many services which it renders have established the importance of its continued provision, maintenance and expedition. In this connection the traffic engineer can and should contribute in a substantial way to the solution of existing traffic problems and to plans for street and highway travel in the post-war period.

It seems that in all cases there are two primary criteria.

Traffic engineers must understand fully the relationship of their work to the basic elements of transportation which are inter-related and largely inseparable. Now is the logical time to look beyond the mere control and regulation of vehicular and pedestrian movements as they occur, in order to seek out and interpret the underlying causes for and relationships of such movements. Here a fuller understanding of economic needs and utility, and the value of planning for motor vehicle transportation is essential. We must look deeper than the mere manifestation of traffic as it is found on the highway. We must work harmoniously with the various agencies in a complementary professional manner, using mutually all findings of common concern.

The sound development of the traffic engineering profession requires at all times the procurement, analysis and interpretation of pertinent factual data. As in all engineering fields, factual evidence shall prevail, and if approached on this basis, rather than on speculations and opinions, great opportunities for advancement lie ahead.

Is it comprehensive? Is it factual?

William S. Smith

Board of Direction

VOLUME XIII MAY, 1943 NUMBER 8

HIGHWAY TRAFFIC ENGINEERING AS APPLIED TO THE FUNCTIONS OF THE TRANSPORTATION CORPS SERVICES OF SUPPLY

by MAJOR EDWARD G. WETZEL

THE State Highway Departments have long recognized the need for highway planning and traffic engineering in connection with their maintenance and construction programs to assure an efficient operating highway facility for the safe and expeditious movement of motor vehicle traffic.

The Transportation Corps—the traffic manager for the Army—has similarly recognized the need for highway planning and traffic engineering in the performance of that portion of its mission relating to the movement of motor vehicles directly or indirectly concerned with the war effort. Accordingly, there has been established within the Highway Division of Transportation Corps, a unit known as the Highway Traffic Engineering Branch which represents the interests of the Transportation Corps:—in the movement of all motor vehicles using the highways in the war effort; in the development, supervision and operation of highway traffic circulation and control plans designed to provide free flow of traffic through highly congested areas in and around ports and other War Department installations and War industries; in the coordination of traffic engineering activities through our field personnel and state and local highway traffic officials and other government agencies appropriately concerned with traffic movement; to the end that necessary highway traffic control facilities are provided for efficient utilization of existing highways essential for the movement of War production, materiél, supplies and persons, in which the War Department is concerned.

In order to perform successfully the mission as outlined, we must look to the State Highway Departments for the technical assistance and information through their traffic and planning studies, to determine the factors and conditions which restrict in any way the free movement of highway traffic in the interest of the war effort. Highway deficiencies, such as weak and narrow bridges, tunnels with limited clearance, slippery or poorly maintained road surfaces, inadequate or poorly maintained shoulders and drainage facilities, improper or lack of route markings, restrictive state or local laws, such as oversize and overweight limitations and traffic regulations peculiar to toll facilities, points of congestion and delay, such as confusing intersections, unwarranted or poorly timed traffic signals and systems, unnecessary stop signs and markings, conflicting train switch and vehicular movement, unregulated pedestrian crossings and such other conditions that affect the movement of vital war materiél and workers must be recognized as traffic bottlenecks, which definitely restrict vehicular motor movement. It is the job of the Highway Traffic Engineering Branch, through tested traffic engineering techniques and with the cooperation of the state and local traffic and planning engineers, to study such conditions as are described above and through proper channels make appropriate recommendations for improvement of such conditions toward more efficient utilization of existing highway facilities and maximum safety of movement.

It is essential that our field personnel maintain close liaison with state and local highway traffic authorities, and other governmental and civil agencies that are appropriately concerned

with the control of motor traffic. The movement of war traffic via highway into ports, staging areas and other large War Department installations or industrial areas must be regulated and controlled to assure its free flow. Traffic plans for such control must be developed through the cooperation of the state and local highway traffic authorities. Similar plans to be utilized in case of emergency due to air raids, blackouts, etc., must also be developed to assure uninterrupted movement of all vehicular traffic essential to the war effort.

It is hoped the field personnel of the Highway Traffic Engineering Branch may have the cooperation and technical assistance, through the State Highway Departments, of the state and local highway planning and traffic engineers, to facilitate development of traffic plans and assure uninterrupted movement of all vehicular traffic in which the War Department is concerned. This cooperation between the officer personnel representing Transportation Corps and your offices, may frequently be accomplished through the State Highway Department representative of the State Highway Traffic Advisory Committee to the War Department. The wholehearted cooperation in coordinating our all-out efforts to assure uninterrupted flow of war traffic with maximum safety is vital to the war effort.

A paper presented by Major Edward G. Wetzel, Office of the Chief of Transportation Army Transportation Corps Services of Supply, Washington, D. C. before the American Association of State Highway Officials, St. Louis, Mo., Dec. 1942.

WAR ON WARTIME TRAFFIC

by EARL J. REEDER

ASSISTING officials of war plants, cities and states in five areas of war industry activities in four states has been one of the major jobs undertaken by the National Safety Council's Traffic Engineering Bureau.

One of two things had happened in these areas: Community or state officials had recognized a need for more effective group riding programs and participation in a community staggered-hours program, or plant officials had recognized the increasing problems of employee transportation.

In Salt Lake City, a "Rides Bureau" has been organized in the business district to assist in the promotion and creation of "share-the-ride clubs." The Bureau serves as a central clearing house for workers of smaller establishments and also workers in larger firms and industries who cannot find rides or riders among fellow employees registered with their firm's transportation committee.

The Salt Lake *Tribune-Telegram* and the Salt Lake Chamber of Commerce were very cooperative in the formation of the "Rides Bureau." The newspaper is furnishing office space adjacent to the street in its building, ideally located in the center of the downtown district, while the Chamber of Commerce is sponsoring the Bureau and the city is furnishing funds and additional assistance for its operation.

Shoppers and students make up a big percentage of the peak period mass transportation load. A publicity program is therefore being directed toward the desirability of limited hours of shopping between 10:00 A.M. and 4:00 P.M. and downtown merchants emphasized this need in their pre-Christmas advertising.

For years "student tickets" have been valid between 7:30 A.M. and 7:30 P.M. and a recommendation was made to the Public Service Commission of Utah to place the evening dead-line at 4:30 P.M.

Workers at Fort Douglas and students at the University of Utah use the same mass transportation routes. Formerly they required service at the same time in the morning and many were being passed up by overloaded buses, thus arriving late to school or work. The Fort has divided its workers into two groups, so that one group now precedes and the other follows the student use of buses and street cars. If this does not successfully relieve the difficulties, the Student Counsel and University Officials have agreed to change the beginning time of class periods.

A recommendation was also made in Salt Lake City to change working hours of 5,000 office and retail store workers in the business district.

Like Salt Lake City, Ogden's peak period mass transportation load contained a large number of shoppers and students. The publicity program on shopping hours and the "student ticket" recommendation are therefore being promoted in Ogden. Retail stores which formerly closed not earlier than 6:00 P.M. are now closing not earlier than 6:30 P.M.

A state-wide survey of the conditions of tires on vehicles revealed that two out of five cars had at least one smooth tire and one out of five had two or more smooth tires. This survey was the basis for a recommendation to the Utah State Road Commission by the Utah Highway Traffic Advisory Committee of a state-wide 35 miles-per-hour speed limit. Approval was given and the limit is now in effect throughout the state.

The assistance given at Decatur has been of a broader scope than at some of the other cities. During construction of the Victory Ordnance Plant, field surveys and plans for access roads were made and recommendations submitted to the War Department and the State Engineers. Help was also given on parking plans. This included specifications and design for maximum utilization of available space and proper routing of vehicles entering and leaving the several parking lots at the plant.

Last summer some of the retail stores changed their hours from 9:00 A.M. - 5:00 P.M. to 9:30 A.M. - 5:30 P.M. to reduce peak bus loads. The high school, located in the business district, assisted further by breaking the group of students formerly dismissed at 3:30 P.M. into two groups, discharged at two separate periods. However, since October the bus passenger load has increased 40% and further staggering of hours is thought necessary. In peak periods many persons are left standing at the curb at present by buses already filled to capacity. Surveys are complete of employee working hours in stores, offices, and plants and these data are being studied with a view of adopting a more comprehensive staggered-hours program. Twenty-eight per cent of the bus stops throughout the city have been eliminated for the duration.

The City Council has placed the responsibility for the war transportation program on the Decatur Traffic Commission. Transportation Committees have been organized in companies with 100 or more employees, and a number of excellent group riding programs have been set in motion within these companies.

A community car pooling program is also planned. This will be located in the Police Department's Traffic Bureau as soon as materials for the program are completed.

Traffic Engineering assistance is being rendered to the Emergency Traffic Commission of Greater Little Rock in setting up a group riding program.

Materials were prepared for a "share-the-ride" program and subsequent meetings were held with managers of the larger stores, offices and plants. One-hundred and forty companies em-

ploying 25 or more persons organized transportation committees and they are making rapid progress in forming car pooling clubs. One large firm has reported a car occupancy of 3.6 persons-per-car while several smaller firms have reported even higher rates.

A central car pooling bureau has been set up at the Chamber of Commerce. Registration cards have been distributed through the Bureau to smaller stores and offices in Little Rock and North Little Rock. This Bureau, in addition to acting as a central reference office for individuals who voluntarily ask for information, is promoting car sharing by matching cards which have been filled out. After cards are matched, company transportation committees are notified of names, addresses, and telephone numbers of individuals with whom employees in their firms may form "share-the-ride clubs."

In the Quad-Cities Area the objective was to develop a coordinated transportation program among 2,000 retail stores and 100 war production plants. The Rock Island Arsenal, located in the center of the area, had the largest single group of employees.

The Council representatives studied routing, parking and other means of minimizing congestion of Arsenal traffic. Employee directories were compiled in the major war plants and for the business district of the three larger cities. Swap-ride bureaus have been established in at least 30 of the largest plants and in the downtown district in three of the cities. At the Arsenal, car occupancy has risen from 2.2 persons per car in August to 2.6 in October, and cars carrying two or less persons has dropped from 75 per cent to 52 per cent during this same period. At another plant car occupancy has risen from 2.5 to 3.5 persons-per-car.

The Tri-City Bus Lines, which serve the area, is financing the cost of maps which are being used in the swap-ride program.

To relieve the mass transportation bottleneck, a staggered hours program was inaugurated in the business districts November 1. Moline, Davenport, and Rock Island retail stores changed their hours from 9:00 A.M. - 5:30 P.M. to 9:30 A.M. - 6:00 P.M. after voting on the recommendation of the War Transportation Committee. Ten new buses have recently been delivered, and this has helped to relieve the further need for staggering working hours.

Other steps taken to relieve mass transportation in this area were the elimination of 133 bus stops and the shortening of several routes.

The Council's Traffic Engineering Bureau is also giving assistance at the present time to Texarkana, Arkansas—Texas, Orange, Texas and Peoria, Illinois with their war transportation problems and has given some assistance to Mobile, Alabama and the States of Washington and Oregon.

An abstract of an original paper by Earl J. Reeder (Mem. I.T.E.), Traffic Engineer, National Safety Council, Chicago, Ill.

TRAFFIC SIGNAL ILLUMINATION

by KIRK M. REID

DAYTIME: Normal operation of traffic signals at full effectiveness is important during the daytime to safeguard and expedite transportation of men and materials. Where lighting restrictions are in effect during the night hours the objective is to meet the restrictions by some method which does not sacrifice normal signal effectiveness by day.

NIGHT—no lighting restrictions: Full signal effectiveness aids the war effort by contributing to traffic safety and facility at night where no light-

ing restrictions are in effect, as it does during daylight hours.

NIGHT—blackouts: The War Department Specification, "Traffic Control During Blackouts," requires that traffic signals *not* be altered or modified for blackout purposes in any manner tending to impair their normal usefulness and visibility. This recommendation, consistent with that applying to street lighting, has the objective of avoiding unnecessary traffic delays and hazards. Experience in England and trials in this country have shown that use of the British type of blackout traffic signal mask — which obscures all the lens except two slits approximately ⅛ inch by 3 inches in the form of a cross—results in dangerous ineffectiveness of signals by day. Their utility is greatly impaired even at night under normal street lighting.

Any form of mask lessens traffic signal effectiveness. Signals should therefore be operated without modification except during blackouts, or during sea-masking dimouts. During such restrictions, signals at important locations may be dimmed by reduction of voltage, while those at less important locations are extinguished. The required reduction of voltage can be obtained by transformers, which at least two manufacturers are ready to supply, or by resistors in series with the signal lamps. In either case individual manual control is indicated to minimize material requirements.

NIGHT—dimouts, sky masking: It is not likely that traffic signals operated at full normal effectiveness contribute in any measurable degree to skyglow. A representative 4-way signal, equipped with standard 60-watt traffic signal lamps and standard sun visors 6 inches long at their peaks, emits approximately 60 lumens above the horizontal. This is less than the total light emission of a 6-watt lamp. Since metropolitan areas seldom average more than 50 signalized intersections per square mile, it would not appear necessary to handicap and jeopardize traffic movement by requiring restrictions of traffic signals in dimouts ordered for the purpose of limiting sky glow.

NIGHT—dimouts, sea masking: Traffic signals *visible from the sea* may aid enemy naval craft in detection of coastal shipping at night. At intersections carrying a limited volume of night traffic, such signals may well be extinguished during the hours of darkness. An alternative is night operation of the signal lamps at sharply reduced voltage with the addition of a mask obscuring all but a few per cent of the area of those lenses having direct sea exposure. The disadvantage of this method is that such masks would normally remain in position during the day, resulting in sharply reduced signal effectiveness. No War Department Specification has yet been issued covering an approved standardized treatment of such signals.

Condensed from a paper entitled Blackout & Dimout of Street Lighting and Traffic Signals presented by Kirk M. Reid (Mem. I.T.E.), Illuminating Engineer, General Electric Company, Cleveland, Ohio, before the Illuminating Engineering Society, St. Louis, Missouri, September, 1942.

THERE'S STILL SOME NON-DEFENSE TRAFFIC

by WAYNE N. VOLK

MONTHS before Pearl Harbor traffic engineers were combating problems brought about by increased industrial and business activity. They have since performed a tremendous service to the war effort by arranging staggered working hours and ride-sharing programs, as well as by retiming traffic signals, marking by-pass routes, eliminating bottlenecks. and

generally expediting the flow of war transportation.

War transportation has been and will continue to be of major importance to traffic engineers. We must not, however, forget that there is still a great deal of so-called "non-defense" traffic on our streets and highways. In fact, Wisconsin recorders show that traffic decreased an average of only 25 per cent in November, 1942, compared with November, 1941, or to put it another way, there was still as much traffic as in 1938, when we thought traffic was heavier than many of our streets and highways could safely carry. Much of this is still non-defense traffic concerned with the feeding, clothing, housing, and heating of the general population. The importance of these activities is indicated by the fact that the government estimates that nearly as many persons will be engaged in such activities as in work more directly connected with war material production.

It is difficult at this time to estimate the reduction in accidents which will result from the reduced speed and amount of traffic. It appears that in Wisconsin this reduction will be in the neighborhood of 40 per cent in November and December compared with corresponding months last year. If we can assume this reduction to be nationwide, there will still be 20,000 or more traffic fatalities in 1943.

Granted that a considerable amount of traffic today is war transportation, that many of the accidents occur to war workers, and that war traffic patterns are frequently much different from normal patterns, it still is likely that the same old "death corners" will produce their share of accidents and the bottlenecks we have long been working to eliminate will take their toll in wasted time and gasoline. Therefore, traffic engineers must be careful not to devote their efforts exclusively to war plants and defense routes, but must also keep an eye on the conditions and locations which have been giving trouble all along. If non-defense activities are so important as to occupy nearly one-half of our nation's energies, they are still of great importance to traffic engineers.

It is frequently said that under the stimulus of this war many new materials and procedures will be evolved which will be of enormous benefit and importance after the war. Traffic engineers are fully aware of the potentialities in many of the developments announced so far, and there are undoubtedly many more products which they will find extremely useful. In order that the most advantageous use be made of these materials, it is important that some planning be done now before an attempt is made to mold these new materials to fit present standards. It would be far better to revise and expand our standards to fit the potentialities of the materials. For instance, the perfect sign material ought to embody as many as possible of the above potentialities: correct and permanent colors, sufficient rigidity to withstand average abuse, inherent reflectivity of a high order, surface hard enough to resist defacement, ability to take stenciled lettering, low cost, light weight, long life. We should use our present knowledge to revise our standards for signs and other traffic control devices to have them ready for the time when new materials and methods are available.

Post war conditions (including traffic) are certainly not likely to be merely an extension or continuation of pre-war conditions. Major wars always accelerate changes. The last war resulted in the meteoric rise of the automobile, and many persons feel that this war will accomplish the same thing for the airplane. Traffic engineers should keep close and constant touch with developments in that field, both because of its dependence on au-

tomotive transportation and because of the effect it will undoubtedly have on their profession. If the airplane becomes a popular means of long-distance transportation, it will affect the traffic profession because of the necessity for terminal facilities and terminal-to-destination transportation. If a "flying car" is produced, capable of use as a land vehicle in and near cities and as an airplane for medium and long distance trips, the transportation picture and professional outlook of traffic engineers will be radically altered.

The last war and the rapid development of the automobile afterward created the profession of traffic engineering. This war, with its huge traffic problems and development of new materials, methods, and forms of transportation, challenges the capability and adaptability of the profession.

An original article by Wayne N. Volk (Assoc. I.T.E.), Traffic Enginer, State of Wisconsin, Madison, Wisconsin, January, 1943.

HELP WANTED

by WILLIAM R. McCONOCHIE

THE small savings we have scorned have caused approximately 2¼ million autos to be de-commissioned during the past year. War production is not going to be allowed to fail for lack of transportation; we have too many aces in the hole. For example, workers could be housed in tent cities in the warmer climates, or in barracks or barrack-like use of private homes. War workers' camps adjacent to industrial plants are a very real possibility.

Another way in which failure of rubber-borne transportation could be offset to maintain production of war materials would be to transfer contracts to cities with predominantly rail transportation. In Michigan, 75% of all war workers are dependent on private automobiles. In the city of Chicago, however, only 25% of the workers use automobiles and only a small portion of this group is solely dependent on that type of transportation. Most plants in Chicago could produce 100% to 150% more war material by 24-hour-a-day, 7-day-a-week operation. Most of the plants work only two shifts per day and have only one-half to one-third as many workers on the night shift as on the day shift. Any conceivable number of workers could be transported for the second and third shifts. Beds and living quarters, as well as machines, might have to be used on a three-shift basis, but most of the larger cities could solve the housing problem. If Michigan workers squander their vital transportation facilities, Michigan cities, except for Detroit, may lose both their war contracts and their populations. If Michigan passes the buck in this transportation crisis, Chicago will pass the ammunition.

Watch the rate at which vehicles are de-commissioned because of the many restrictions being placed on their use. In New York State, the deadline for re-registrations has already passed and yet there are less than 80% as many vehicles registered as there were at this time last year. In Illinois, the registrations up to February 1 were only 49% of what they were on that date a year ago. In Indiana, registrations to date are only 56% of what they were a year ago. Registrations in Wisconsin on February 1 were 31% of what they were on that date a year ago. Legislators are proposing a cut in license fees for holders of "A" gas ration books to $5.00 to keep autos in use. The Automobile Manufacturers Association estimates that 25,200,000 automobiles were registered at the end of 1942. If only 80% are re-regis-

tered, there will be only 20,000,000 licensed autos in a few weeks. The reduction may be materially greater. Watch this factor, and provide alternate transportation accordingly.

Another factor is the employment of women in industry. The replacement of 100 men with 100 women at some plants resulted in 34 fewer autos being available for worker transportation. Most of these women simply do not have automobiles available and will have to be transported by some other means. Not less than 3,000,000 women will swarm to industrial plants during 1943. The best solution to the transportation problem is for each of us to do what he can. Don't let Victory hang by a synthetic rubber thread.

Digest of a paper presented by William R. McConochie (Mem. I.T.E.), Traffic Engineer, Chicago Surface Lines, at the 29th Annual Highway Conference, University of Michigan, Ann Arbor, Michigan, February, 1943.

TRAFFIC AND PARKING

THE Regional Plan Association at 400 Madison Avenue, New York, N. Y., recently announced the publication of its comprehensive Traffic and Parking Study which was developed over a period of two years in cooperation with city officials.

For years leading traffic engineers and city planners have been preaching the interrelation of terminals and highways in central cities and stressing that adequate, properly located, designed, maintained and operated off-street parking facilities are as important as the highways to a sound solution of urban congestion and business decentralization.

The Regional Plan Association's report demonstrates the wisdom of this view and provides an approach to several of the vexing obstacles which stand in the way of realizing a functional comprehensive circulation system. One obstacle, namely that of determining the potential space required for future parking, has been squarely met. The results are illuminating.

Some of the proposals for construction of strategic express highway links are already under development as part of the city's Post-War Works Program; some administrative changes such as strict parking-law enforcement have been adopted under pressure of war needs, and others are under study in appropriate departments. The report points to zoning and legal changes which must be instituted now to develop the program on a solid front, and it reveals a potential field of profitable, useful private investment in parking garages in the post-war period if the necessary legal changes are made now.

The study criticizes the Parking Authority bill introduced at Albany, N. Y., last year, and proposes instead a city administrative agency to bring about coordinated handling of the parking problem by all the public agencies directly involved.

The Association assembled the mass of available facts and previous proposals, and conducted special questionnaires to fill in vital missing links of data. Curb parkers and parking lot and garage customers were questioned to determine their place of residence, purpose of their trips to the city, and parking habits and needs, revealing among other things the extent of the *potential* market for parking. Department store customers were questioned to determine their method of travel to the central city and the parking needs of those who own autos.

The study produced the following principal findings:

Parking Habits: About two-thirds

of the passenger cars parked in central areas were used by people on business. Business people park on the average almost twice as long as shoppers. About one out of every six shoppers in the central department stores came by auto under pre-war conditions. Nearly half the shoppers who parked at the curb stayed for less than an hour—a finding which indicates that metered curb parking in certain streets would encourage shopping trips to the city. A large number of the curb parkers drive from nearby points. A large proportion of shoppers, and a smaller proportion of business people and all-day parkers, are willing to pay prices which would enable profitable operation of centrally located parking garages.

Trucking Practices: Loading and unloading of motor freight should be handled within buildings.

Traffic Findings: A large fraction of traffic on central streets was through traffic, which should be accommodated by crosstown express elevated or tunnel routes. Pre-war facilities and regulations were inadequate for the needs of crosstown local traffic and interfered with the transaction of business in midtown Manhattan.

Parking Garages: Present outmoded zoning provisions which apply the same restrictions to modern parking garages as to livery stables, have deterred private capital from investment in a profitable and useful field.

Write Regional Plan Association, 400 Madison Avenue, N. Y. C.

DO YOU KNOW

Reports from California indicate that more than 100 members of our armed forces are being killed or injured on the access roads in the vicinity of bases and camps.

John A. Shisler, City Engineer of Canton, Ohio, used buff bricks for lane markers and to designate parking lanes. Mr. Shisler believes that the permanent brick markers will effect a considerable saving over paint markings.

The National Safety Council credits automobile tire and gasoline rationing with an important part in the record 32 per cent decrease in traffic deaths in June 1942 over June 1941. Traffic fatalities decreased 15 per cent during the first 6 months of 1942 over a similar period last year. Mileage dropped 7 per cent during the first 5 months of 1942.

10,000 fewer motorists applied for new gasoline rations in Dade County, Florida in July.

Cleveland plans to increase the capacity of its transportation facilities by 60,000 by converting trailers into street cars.

Pennsylvania H.T.A.C. and Council of Defense have set up a field staff of 10 men to organize a share-the-car program and to avoid conflict and overlapping by the two state agencies.

California Division of Drivers Licenses is furnishing military authorities with civilian driving records.

R. L. Vaniman, Acting Chief of the Automotive Branch of W.P.B. advocates as feasible and reasonable the adding of a third axle and additional tires to existing four-wheel buses to increase passenger capacity in congested war plant areas and to release truck chassis for war operations. The alteration plan has been endorsed by O.D.T. Four-wheel trucks are being converted for the same reasons.

Tampa, Florida Tribune reports that pedestrians with credential cards can obtain rides from drivers with credential stickers on cars supplied by the Defense Transportation Committee.

The Automobile Club of St. Louis, Missouri estimates that each member of a five person car pool will save $259 annually through reduced use of his car.

GROUP-RIDING PROGRAMS

by MERL T. CALEF

THE word "logistics" is used more now than during the first World War. Logistics in that science which treats of *moving* or *supplying* armies and conducting campaigns. Almost every ounce of war material from source to battle line at some time rides on rubber tires.

Today America is a "have not" nation as to crude rubber supply, and also a "have not" nation as relates to operating plants for producing sufficient synthetic rubber.

The Gary group riding program consists of 3,000 swap-ride groups who have adopted approximately 3,000 different types of riding agreements. This may be due to Gary's particular location as one of four contiguous cities with a total population of nearly 300,000, and the inter-city residential and employment situation, involving thousands of workers in the steel mills, the oil refineries and the chemical plants.

In order to organize car owners into riding groups one must know from whence every car comes. We prepared three swap-ride maps, one covering the Illinois area, one the four-city area and the third the suburban and county areas. It might be of interest that we have three states, and 11 counties supplying employees into Gary's life. Each map was divided into swap-ride areas the same boundaries prevailing as those of the Civilian Defense Areas. It was contemplated that this would enable us to get more aid in correlating the riding groups of the various industrial plants, but we now have worked out a better way. With the swap-ride area maps, questionnaire cards were provided to each industry and business house. These cards furnished by the State Committee were punched for use with sorting machines, but many thousands had to be punched and sorted by hand into their various classifications providing the following data:

1. Name and address of employee.
2. Swap-ride residence area.
3. Employer's area number.
4. Method of getting to work:
   a. Walking.
   b. Bus or street car.
   c. Driving an automobile.
   d. Riding with some one else.
   e. By train, bicycle, etc.
5. Seating capacity of car and seats available for passengers.
6. Willingness of car owner to share rides with others.

The ODT suggestions were to cover only industries employing 100 or more, but we included all plants.

While these cards were being prepared for sorting and tabulating, the Traffic Engineers made an occupancy check of parking lots at all industries and stores and also checked street traffic. Boy Scouts were used for actual counting. In this count, 17,848 cars were checked with a total of 32,571 riders, giving us a measuring-stick occupancy rate of 1.82. The maximum was 2.18 and the minimum was 1.37. We feel that this sampling was fair to all phases of the work.

Although not all plants have turned in their reports, nevertheless a total of 41,051 questionnaires were turned back to us indicating that 17,360 persons (43%) use street cars and buses to get to work; 16,006 get to work in cars, and the remainder by other means. These cards were sorted and tabulated in part by machines in the steel mills, but we did use successfully a fine cooperating group of ladies from the AWVS and from several other groups.

Now it is with this 16,006 automobiles that we are concerned, and with the other approximate 15,000 cars in Gary, all of which are more or less being used to transport war workers

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to and from their jobs. Plant Transportation Committees in most instances have done a fine job, while in others it is sincerely believed that the management has not yet visualized the possibility of his employees without cars. Some organizations like the railroads, which do mostly or wholly a switching and short inter-city run, have problems of shift work and men-on-call day and night with all kinds of odd hours. This makes efficient ride-sharing next to impossible.

Other results to date are both pleasing and discouraging—discouraging—because there seem to be so many who say "oh we'll get by."

Our publicity work was on a rather broad front. Billboards, plant posters, plant bulletins, newspaper headlines, stories, editorials, cartoons, and plant employee meetings—all were used. Our Post-Tribune carried almost daily stories during the progress of the work. But—our greatest publicity came from the Baruch Rubber Report release and the gas rationing system. It is considered by several that gas rationing has actually delayed many swap-ride groups. Every car owner received his "A" card, and the boards were necessarily generous with war workers, and many others, with the issuance of "B" and "C" gas ration cards. We have found many sincere persons actually not realizing the difference between gas rationing and tire rationing. In the Calumet District we are right in the heart of the petroleum refineries, the largest possibly in the world. Gasoline is plentiful in Gary, but rubber is different.

Following are some of the outstanding, as well as average, plant swap-ride efforts:

Plant A—Now has over 2,400 swap-ride groups out of a total of 6,766 cars. The work is not yet completed. Weekly shift changes in 24-hour operating plants wreck havoc with these group riding programs, and will continue to do so until there is a greater shifting of employees to departments where there can be interdepartmental riding groups organized.

Plant B—With 287 cars in September it has been reduced to 166 in November, a saving of 121 cars or 42%, and raising their occupancy rate from 1.9 to 3.11. 115 groups were organized here and developed a saving of 12,000 tire-miles daily.

Plant C—Compared to the September check of 523 cars, this plant with 124 ride groups has reduced cars to 437, with 87 cars apparently out of service. Only 33 cars are operating with a lone driver. Most of these are in single-employee-ride zones or with top executives using their own cars alone at irregular hours. These 271 cars off-duty every day mean a saving at this plant of 37,100 daily tire-miles, a reduction of 51.8% and gives an occupancy rate of 3.48. Right here let it be explained that we are using two different occupancy rates as checks, the first being the actual, i.e. the total riders divided by total of all cars in use, while the second rate is the ratio between riders in swap-ride cars and the actual number of cars employing swap-ride plan. This latter gives us the efficiency of the carrying capacity of different plant cars and aids us in keeping track of the vacant seats available in any given area.

Plant D—A new war industry, starting from scratch this last summer, enrolls new employees in riding groups as they accept employment. From the time our Committee started work this plant has taken on hundreds of new workers and has reduced the cars at least by 100. They now have 191 cars carrying 726 persons daily, with some 200 cars off-duty each day. In this plant the daily tire-miles saved amounts to 24,000.

Plant E—Curious to learn the potential life of cars as reflected in the owner estimate of life of his tires, we

made a sample poll of tire life in a plant in November 1942 which would afford a fair cross-section of all of Gary's 30,000 automobiles. Here are the facts in this suurvey of tire life:

23% have until May 1943
44% have until August 1943
19% have until February 1944
14% have 18 months or more life

Our swap-ride maps show that these 2,687 cars included in the tire-life survey travel a daily mileage of some 34,090 miles. Cut that mileage to one-fourth and there is a substantial rubber saving. It is hoped that Gary will have at least 6,000 swap-ride groups when our campaign is completed—if ever.

To aid in organizing and filling-up cars as an inter-plant program we have set up a file in the Gary Administrator's office with the 298 swap-ride areas indexed and with a folder for each participating plant, or business house. In case there are riding groups with empty rider spaces in their cars, we place a red tab on the index card of this area, so that at a glance we can tell if there is more car room available. This facilitates quick replies to telephone calls or personal calls to the Administrator's Office on the part of representatives of the Plant Transportation Committees. Our own file provides a clearing house for all plants. Plants are adopting this file for their own offices and when these are all completed the work will be greatly eased for all concerned.

One plant with thousands of employees has set up 10 divisions within their own plant with swap-ride wardens heading the work of contacting every car used in that plant. As soon as this supplemental work is completed they will also have a ride-area warden to cooperate with similar wardens of other plants, and business firms. Eventually every area will have ride wardens from every plant. These men can handle the work of correlating riders and will be given OCD certificates for their work.

Condensed from a paper presented by Merl T. Calef, Traffic Engineer, Gary, Indiana, at the 29th Annual Road School, Lafayette, Indiana, Jan. 1943.

ROADS MUST BE MAINTAINED

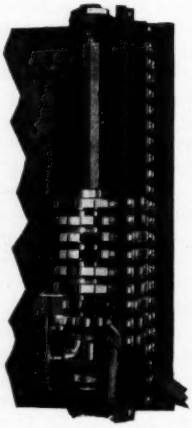
The seriousness of the situation in which state highway departments find themselves is told in an editorial from Engineering News-Record quoting Thomas H. MacDonald, head of the Public Roads Administration.

Curtailment of new highway construction has increased the maintenance operations of the highway departments by making impossible replacement of old roads that are rapidly going to pieces under the increased load of war traffic. Nor have the restrictions on tire and gasoline use brought any relief, for while private automobile traffic has fallen off, truck traffic has increased and the average load per truck has been raised, thus accelerating the rate of wear on highways. Maintenance operations, on the other hand, are made more difficult by loss of men to the armed forces or to war industries and by inability to get replacements for worn-out equipment or spare parts for current repairs.

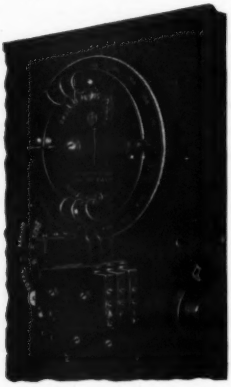
Financial problems add complications to these physical ones. Income from gas taxes and motor-vehicle fees have declined sharply, and probably will fall off more this year. This decline is serious for states having high fixed charges for bonded debt or for those states where fixed amounts must be turned over to counties or other states subdivisions for their road work. Diversion of road funds to other than road purposes adds a further complication in some states. Demands for more diversions may be expected this year.

Editorial, Engineering News-Record, Jan. 1943.

Just Two Examples



CAM UNIT



TIMING DIAL

# of Superior Flexibility

In line with the ODT recommendations for fitting traffic control to wartime conditions, consider the following advantages offered by Crouse-Hinds Type G and Type K traffic controllers:

1. A universal cam unit, with cams having detachable lobes, permits resetting of the color sequence in the field *without the purchase of any new parts.* To change the number of intervals in the color sequence between the limits of 4 and 16 requires only a simple resetting of the cams.
2. Two separate timing splits can be provided on any new or existing standard single dial type G or K controller. Thus it is possible to change the division of the total cycle automatically at various times of the day to conform to different traffic conditions.

CROUSE-HINDS COMPANY
SYRACUSE, NEW YORK, U.S.A.

TRAFFIC ACTIVITIES IN MINNESOTA AND MASSACHUSETTS

Your letter of December 16 to members of the Institute should result in some interesting information with regard to traffic engineering activities over the country and the contribution which traffic engineers and their organizations are making to the war effort. While the details of these activities will vary considerably, dependent upon the conditions in different parts of the country, I presume that traffic engineers in all sections are faced with somewhat similar problems differing only in the extent to which the community is affected by special wartime traffic problems.

We all recognize that traffic engineers, like those in most other engineering fields, have had to re-align their activities with special emphasis being given to access roads, military movements and problems connected with the movement of workers and materials for war production. To a considerable extent this has meant virtually a cessation of activities in strictly rural areas, where because of the drastic reduction in traffic volumes, very few cases have arisen to require attention.

In Minnesota war production activities are largely restricted to the metropolitan area surrounding Minneapolis and St. Paul, and in Duluth. To a lesser extent the iron mines have developed problems but these have been taken care of in more routine manner.

Several access roads in the Twin City area have had to be constructed or reconstructed to handle the increased traffic to the larger plants. Important intersections were redesigned and vehicle-actuated signals have been installed at four locations. These improvements together with special markings wherever needed have eliminated any critical cases of congestion and have reduced accidents to a minimum. In fact the accident record on the major access roads has been so good that we are very much concerned whether it can be maintained. With the exception of one fatality during the construction of the Twin City Ordnance Plant, when an employee fell off a load of lumber during a very strong wind, there have been no serious accidents among employees going to or from work at the major plants.

Emergency lighting has been installed at some locations to facilitate the work of and to protect the traffic officers who must work at those intersections.

Several "Stop" signs have been removed or rearranged to facilitate the heavy movements of essential war traffic.

We have worked closely with the Highway Traffic Advisory Committee and have assisted in a number of surveys and investigations in connection with the "share ride" and "staggered hours" programs. The Assistant Traffic Engineer is serving as Executive Secretary of the Highway Traffic Advisory Committee.

Other activities carried on during the year have involved speed trend studies as a result of the war emergency speed restrictions, the development of substitute materials for signs and other traffic control devices, the adoption of short-cut methods of traffic investigations which are necessary because of loss of personnel.

Attention has been given to legislative problems, especially for the improvement of our driver license and other laws relating to traffic operations.

As operating officials traffic engineers are interested and should take a leading part in improving driver per-

formance to more effectively increase the capacity and efficiency of street and highway facilities on which, after all, highway transport is dependent. During this war unexpected conditions are arising which require emergency action and special legislation to legalize these necessary emergency actions.

The coming year will I believe furnish a real challenge to traffic operation organizations. No one can say just what will develop or what our transportation system will be like a year from now. Certainly the traffic engineer has an unusually good opportunity to be of service to his state or community. He is probably, or should be, in possession of the more important information which will be so necessary in solving the problems that are bound to arise.

Major emphasis must continue to be placed on facilitating essential traffic and conserving rubber, gasoline and other materials. The next year will undoubtedly see a decreased need for attention on rural and other less important thoroughfares.

Accident analyses and studies should be extended so that more use can be made of this type of information. More attention will be given to postwar needs. In this connection traffic engineers might well broaden their activities and their interests to take in not only motor vehicle traffic but the relationships between motor vehicles and other forms of transportation. With air transport very definitely on the increase, postwar transportation cannot help but be changed from prewar conditions. Undoubtedly air and highway transportation will be more closely linked with each supplementing the other. This trend should be anticipated and it would seem that traffic engineers, because of the very nature of their work, can be most helpful in planning for the necessary correlation of these two forms of transport.

W. F. ROSENWALD

I wish to acknowledge receipt of your communication of December 16 relative to present traffic activities of this office and those that are likely to command attention in 1943.

The current functions that you mention have been handled by this office. Some of these such as the staggering of hours and car-sharing were dealt with extensively.

No attempt has been made to overhaul traffic devices. The timing, however, of each state owned signal has been adjusted to meet the needs of war-time traffic. These signals have likewise been masked and some of them have been placed on flashing operation. Details of this work are contained in our report, "Instructions for Restriction of Traffic Lights During Blackout."

Many municipal signals have likewise been masked and many, too, have been put on flashing operation. This resulted from an executive order of the Governor. Copies are available.

This office has also worked out plans for evacuation. These consisted of the establishment of traffic control stations and emergency route system.

Still other functions have engaged our attention. War-time traffic in the vicinities of navy yards, shipyards, ammunition dumps, airfields, etc., was found to be assuming tremendous proportions. Bottlenecks threatened to disrupt not only highway traffic, but, what was more important, the war effort. Surveys were then conducted within the areas mentioned. From the data obtained it was possible to recommend the establishment of one-way streets, parking restrictions, access roads and the use of adjacent lands for parking areas. Moreover, this Department erected numerous additional billboard and directional signs for the guidance of traffic.

To forecast my program for next year would, I feel, be most difficult. Conditions are changing so rapidly, I

feel it would demand almost prophetic vision to even hazard a guess as to the future. A fair amount of our work requires the use of automobiles. But the restrictions on these vehicles are daily becoming more stringent. Similar limitations in regard to civilian automobiles are, as you know, growing apace.

The functioning of our Department hinges entirely on gasoline tax receipts. Because of the dwindling of automobiles and the deflection of tax money into other channels, there is no knowing how much work can be accomplished.

Even though peace were to come late in 1943, I can still conceive of situations that would preclude even a reasonable surmise as to conditions. Likely by mid-year the nation will be geared to a 60% war production. A return to "normalcy" could not be made overnight. It must be gradual.

Again one could pose some very pertinent questions respecting the period of transition. What will be the reaction of the public after the war? Will we experience retrenchment or will we have easy money? What will be the purchasing power of the dollar? How quickly can the automotive industry convert? How cheaply will automobiles be produced? Will the many restraints of the Federal Government ease off, increase or remain the same? All of these, I feel, delimit our activities of the new year.

Regardless, however, of what the year may hold, I think it will be an opportune time for the traffic engineering profession to make some excellent gains. By this I do not mean individual effort. Rather have I in mind the entire body acting in concert.

The fortunes of the profession are so linked with the automobile that whatever affects the latter reacts upon the former. Why not then a series of campaigns. Legislation, generally, to prohibit diversion of gas tax funds is a crying need. By and large, legislators fail to recognize the necessity of scientific control of traffic. An effort should then be made not only to acquaint these persons with the fact that proper control is essential, but that the public is entitled to the protection.

The public, too, through organized campaigns could be made conscious of the rights it has to adequate control and safety. With public opinion aroused, demands for many betterments may follow. It may be that separate highways for pleasure and commercial vehicles would be one of the outgrowths of public insistence.

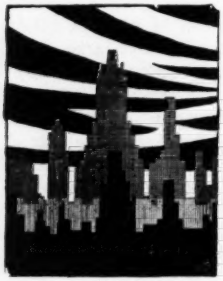
Many other ideas could be worked out. Low priced cars would unquestionably result in greater numbers upon the highways. The volume of vehicles would doubtless provide additional fields for members of the profession. Could not the idea of a small profit on many cars be sold to all motor vehicle manufacturers?

I think, too, that proper cooperation with planning boards, manufacturers and the like could well lead to a gradual scientific decentralization of too populous centers. Here again the profession would benefit since less dense populations turn naturally to automobiles.

Some scientifically-minded persons tend to the idea that following the war, air-borne traffic will become an important feature of transportation. This may happen. I for one, however, do not think that air travel will replace or make any serious inroads on the use of the automobile. To my mind, the widespread use of planes for all purposes is dependent upon too many other factors.

My eagerness to be of assistance has caused me to enlarge my ideas to great breadth. I trust that you will find something among them that will be helpful to Institute members.

EDGAR F. COPELL



Stop, Look and Listen

MANY THANKS!

The Officers, Board of Direction, and Editorial Staff of TRAFFIC ENGINEERING wish to thank those members of the Institute who replied to President Mickle's letter of February 4th regarding our publication. The many thoughtful suggestions will be of material aid in the development of future policies regarding the magazine. Please accept this statement as an acknowledgement of your letter and again, many thanks.

CONGRATULATIONS

John F. Gallagher (Assoc. I.T.E.), former member of the staff of the Philadelphia Traffic Engineering Department, was recently promoted to the rank of Lieutenant Commander, U.S.N.R. and is stationed at the U. S. Navy Yard, Philadelphia as District Transportation Officer in Command of the 4th Naval District.

Fred C. Tarbox (Jun. I.T.E.), former Assistant Traffic Engineer, Division of Traffic and Safety, Ohio Department of Highways, has accepted the position of Safety Engineer with the U. S. Truck Lines, Inc. of Delaware, 1438 Midland Building, Cleveland, Ohio. Mr. Tarbox has been serving in this capacity since March 1st and is in charge of the safety activities of his company which includes 11 subsidiary companies which operate in 8 states.

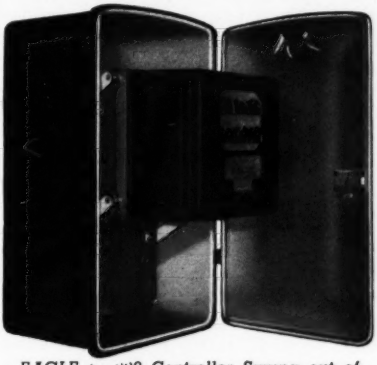
BROKEN TRAFFIC LINE STRIPING MACHINE DEVELOPED

The California Division of Highways has developed a new machine to automatically paint an interrupted traffic stripe. The plan being used in California is a 15-foot painted stripe, with a break of 25 feet. This new device is an air-control attachment mounted directly on the paint striping machines now in use. The coordination and synchronization of the paint spray guns and the glass bead dispenser are accomplished by a rotary disc type air valve. This valve is driven by a variable ratio mechanism so as to compensate for different field conditions, enabling the operator to maintain a cycle length of 40 feet.

To accomplish this, a synchronizing pointer is set at the point of beginning the line, the mechanism is engaged by a hand lever, and the broken stripe automatically is laid down as the machine progresses over the highway. When it is desired to stop the painting process, this is accomplished by turning a hand valve, or by disengaging the air valve driving mechanism shifting lever, depending upon the station in the cycle at which the line is to terminate.

Variations in the tire air pressure and the desirability of matching a new stripe with an old one when re-striping and the beginning of the stripe at a particular point necessitated a de-

NOW AVAILABLE

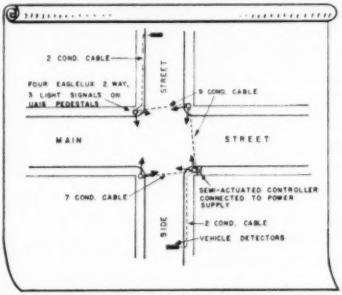


EAGLE E1-600 Controller Swung out of Cabinet on Folding Frame

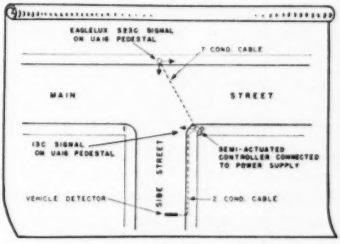
for WAR PLANT PROTECTION

ACTUATED traffic signal equipment meets DEFENSE TRANSPORTATION needs for protection without costly delay to vital production.

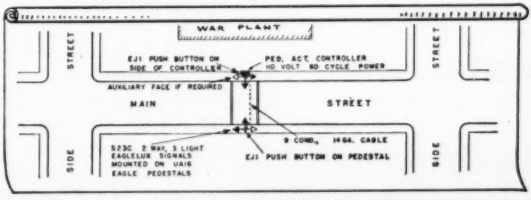
Available for push button or vehicle actuated control. **Ask** for Bulletin No. 252.



THIS SEMI-ACTUATED SIGNAL installation assures protection for workers in vehicles or on foot.



THIS ACTUATED INSTALLATION is ideal for that parking lot problem.



THIS PEDESTRIAN ACTUATED SIGNAL installation provides good protection for the war worker on foot.

INVEST IN LIBERTY BY BUYING WAR BONDS

EAGLE SIGNAL CORP.

MOLINE ILLINOIS

gree of flexibility in the mechanism. A period adjustment is provided that changes the length of the cycle while in motion if the operator so desires.

There will be times when it will be necessary to make a break in the cycle length of 15 feet of painted line and 25 feet of interrupted space, such as when striping up to a cross-over or other interruption in the established marking. When this situation is encountered, the machine may be changed from automatic to hand control.

The operation of the striping machine with the automatic interrupting mechanism can be carried out at the accustomed speeds and in the usual manner. Single lines with or without beads may be painted, as well as multiple line stripes with or without beads.

The adoption of the interrupted, or broken, traffic line in place of the present continuous stripe, and the substitution of a 3-inch broken line for the former 4-inch solid line is estimated will result in a minimum annual saving in paint alone of approximately $90,000.

A considerable additional sum will be saved by eliminating the glass beads from the unpainted portions of the traffic stripes. It is estimated that the total saving for paint and beads will amount to approximately $112,000 per year.

Contributed by E. B. Lefferts (Mem. I.T.E.) Automobile Club of Southern California from California Highways & Public Works, September, 1942.

SMOOTHER PAVEMENTS

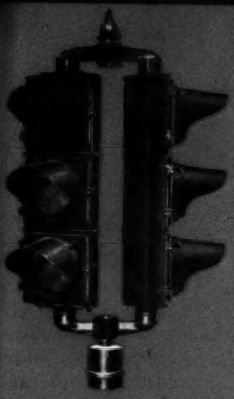
One of the curious changes that the war has brought is a recommendation that the non-skid qualities of pavements be reduced as a means for saving wear on tires. Heretofore, the efforts of highway builders have been centered on giving pavements non-skid surfaces. Studies made for the Highway Research Board by the engineering staff at Iowa State College show that pavement roughness is a major factor in tire wear and that the rate rises sharply as speeds go above 40 m.p.h. As a result, Prof. R. A. Moyer, head of the pavement roughness study, recommended to the Highway Research Board that as an emergency measure, pavements having a rough surface be given a seal to reduce abrasive qualities, keeping the amount just below that which might produce a slippery surface. This recommendation might be considered too radical for safety were it not for the war-time speed limit of 35 m.p.h. that now controls all traffic moving on our highways. So long as that speed limit is observed, the danger of skidding on highways is greatly reduced. Nevertheless, if the 35-mph. speed limit is strictly observed, pavement roughness becomes a less important factor in tire wear. Hence, unless the synthetic rubber program cannot be expected to bring some measure of relief for many months, a wise precaution would appear to be to limit seal-coating to only the most abrasive types of surface.

Editorial, Engineering News Record, January 14, 1943.

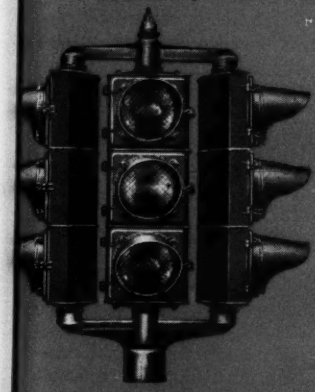
BILLBOARD OR BUSINESS SIGN

The Vermont Supreme Court in January of this year in the case of Kelbro, Inc., (Kelly Bros.—billboard concern) v. The Department of Highways, Secretary of State, et al., rendered a far-reaching decision regarding the use of land abutting highways. The Vermont Supreme Court declared that it was not unconstitutional discrimination to permit a business to advertise on its premises the products sold there while prohibiting the renting and maintaining of billboards on private property within certain distances of highways and highway crossings.

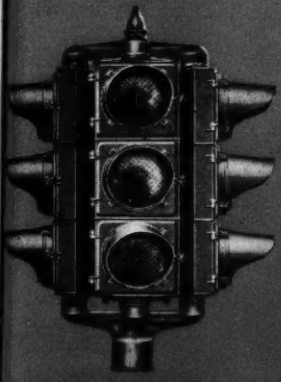
In a unanimous decision the court held in effect:



Type TRP-223 M
-way aluminum mounting brackets
with separate slip fitter



Type TRP-333 M
-way aluminum mounting brackets
with integral slip fitter



Type TRP-443 M
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TRAFFIC SIGNALS YOU'LL BE PROUD TO INSTALL

PROUD! Because you have accomplished something really fine — an installation of signals that you can point to with pride and feel good and glad because it's your work. Sturdy and attractive Marbelite Signals! Better Built quality that you will find difficult to match anywhere. And how you will appreciate those aluminum mounting brackets which replace the troublesome pipe fittings assembly—brackets which make the signal so much more compact!

It's no wonder that so many of the large Municipal and State Highway Traffic Departments are installing hundreds of Marbelite Signals. These Better Built Signals are bound to win the preference. Write today for a descriptive folder, and request quotations on the type signals you would like to install.

THE MARBELITE CO., INC.
26 WARREN ST., NEW YORK, N. Y.

MARBELITE

BETTER BUILT SIGNALS

Outdoor advertising is a use of the highway, not of abutting private property.

The easement of visibility from the highway is a limited one. Private ownership includes no inherent constitutional right to rent out sites for billboards.

There is no inherent right to use the highways for commercial purposes.

The decision of the Vermont Supreme Court this January will stand with the Massachusetts decision in January of 1935.

It is also interesting that public officials of a neighboring state applied for and were granted permission to file an amicus curiae brief on the side of the public interest.

American City Magazine, Feb. 1943

NOT COUNTING LOCAL INDIVIDUAL AND MASS CARRIERS!

Transportation in America has an overall investment equal to 25 per cent of the available national wealth and approximately 28 per cent of the nation's total buying power. Engaged in transporting the commerce of the country are 140 so-called Class I railroads, 550 shortlines, 2,600 different waterway companies, 3,900 intercity bus companies, 27 airlines and over 40,000 trucking companies.

Donald D. Conn, Executive Vice-President of Transportation Association of America

ON THE SHELF

Blackout Requirements for Highway Movement by U. S. Office of Civilian Defense, Washington, D. C., 1942, 7 p. (War Department Specification).

"Freight Fleet Cuts Accident Costs 80%" by W. B. Montagne in *Fleet Owner,* Vol. 29: No. 4, Oct. 1942, pp. 28-29, 32, 34, 95.

"How the Army Trains Its Drivers" by Kenneth N. Beadle in *Safety,* Vol. 29: No. 10, October, 1942. p. 234-236.

"New Traffic Signal Blackout Unit" by H. E. Simmons in *American Highways,* Vol. 5: No. 4, October, 1924, pp. 11-13.

Why We Have Automobile Accidents by Harry R. DeSilva: An exhaustive treatise and outline of various phases of the highway safety problem. This book challenges the attention of all highway administrators. John Wiley & Sons, New York, N. Y., 1942, 394 pages.

"Will Our Highways Fail Us?" by Richard H. Rush in *Domestic Commerce* (Weekly Bulletin), Vol. 30: No. 16, October 15, 1942, pp. 19-23.

Facts About Traffic Accidents in South Carolina. 1942 Edition: A statistical report of accident analysis tabulations and procedures with considerable information of value to traffic accident engineers. Compiled by Traffic Engineering Division, South Carolina State Highway Department, Columbia, S. C.

Transportation in the Public Interest: A report on Public Aids to Transportation, Competition and Relative Economy and Fitness of the various types of transportation, published by National Highway Users Conference, National Press Building, Washington, D. C.

Annual Report, Traffic Control Division, Engineering Department, Seattle, Washington, 1941—Report of the activities of the year of 1941 of the Traffic Control Division, Engineering Department, showing how the many new problems created by war traffic and production are being handled.

Swap-Ride Plan for the State of Oklahoma: prepared by the Oklahoma Highway Patrol: Describes promotion, mechanics of the program, sorting of questionnaires and exhibits.